

## SUNFLOWER

**J1.** Sunflower competes poorly with weeds because of slow early growth and incomplete ground cover. Cultivation with a spike-tooth or coil spring harrow about 1 week after seeding but before sunflower emergence will kill weeds that emerge before sunflower. Harrow or rotary hoe when sunflower has at least 4 leaves. Cultivation will control weeds between the rows.

**J2. Spartan** (sulfentrazone), **Spartan Charge** (sulfentrazone & carfentrazone), or **BroadAxe XC** (sulfentrazone & S-metolachlor) may partially control wild buckwheat, marshelder, hairy nightshade, but provides no perennial weed control. Adjust rate for soil texture, soil pH, and organic matter content. Herbicide solubility, activity, and phytotoxicity increases as soil pH increases. Crop injury will be minimized and greater likelihood of activation by rainfall will result if applied up to 30 days prior to planting. Sunflower has good tolerance to Spartan on medium to fine textured soils with OM above 3%. Crop injury may occur on soils with low OM and soil pH greater than 7.5, especially on calcareous outcropping. Poor growing conditions at and following crop emergence, cold temperatures, soil compaction, or rates too high based on soil type and OM may result in crop injury. Spartan requires a minimum of 0.5 to 1 inches of water for activation before weed emergence. The approximate ranking of crops from most to least tolerant to sulfentrazone is: soybean, flax, chickpea, mint, sunflower, potato, field pea, dry edible beans, safflower, crambe, canola, lentil, and sugarbeet. Refer to label for crop rotation restrictions.

### HERBICIDE RESISTANT SUNFLOWER

#### **Clearfield Sunflower**

**J3. Beyond** (imazamox) applied POST to Clearfield sunflower hybrids will not control wild buckwheat, ragweed, lambsquarters (> 2 inches), biennial wormwood, Canada thistle, and ALS resistant weeds. Apply with MSO adjuvants plus UAN or AMS. Temporary sunflower yellowing and stunting may occur. Refer to label for application information, use restrictions, and crop rotation restrictions.

#### **ExpressSun Sunflower**

**J4. Express\*** tribenuron applied POST to ExpressSun sunflower hybrids does not control grasses or ALS resistant weeds. MSO adjuvants provide greatest herbicide enhancement. Express\* may antagonize POST grass herbicides when applied together. The antagonism can be reduced or avoided by applying a higher rate of the grass herbicide or applying the grass herbicide 1 or more days before or 7 days after Express\* application. Do not apply any other ALS herbicide on ExpressSun sunflower varieties or severe sunflower injury or death will result. Refer to label for use directions and other information.

\*Or generic equivalent.

## FLAX

**K1. Flax** is less competitive with weeds than small grains and should be grown on relatively weed-free fields. Seed flax on fields with low weed levels by controlling weeds in preceding crops. Flax should be seeded directly or with shallow spring tillage in fields. Deep tillage of fields could bring dormant seeds to the surface and increase weed problems. For weedy fields, moldboard plow the soil to bury weed seeds, thereby reducing the weed infestation the following crop season. Moldboard plowing can reduce infestations of small-seeded weeds like foxtails and kochia, which have short seed survival.

Weed control is needed before flax emerges to reduce yield losses since flax is a poor competitor with weeds. Soil-applied herbicides reduce weed emergence and minimize early weed competition to maximize flax yields. POST herbicides applied soon after weed emergence to small weeds and flax usually give better control and allow more time for flax recovery from possible herbicide injury than treatment to larger weeds and flax.

**K2. Treflan\*** (trifluralin) may be fall-applied on fields to be seeded to flax. Granular formulations may be applied to standing stubble. Use liquid or granular formulations when residue will not interfere with incorporation. Seed flax less than 1.5 inches deep into a moist seedbed. Incorporate shallow and seed deep or seed shallow with deep incorporation to maximize crop safety.

Treflan\* is not labeled for spring application in flax because of injury risk but may be spring-applied if user assumes all liability for crop safety. To reduce potential of flax injury, spring-apply no more than 0.5 lb ai/A and incorporate as early as possible to create a firm seed bed through rain and soil compaction. A firm seed bed will promote uniform depth-seeding for uniform emergence. Early application will allow more time for degradation of "hot spots" in soil.

## CANOLA AND MUSTARD CROPS

**L1. Mustard crops** in the early seedling stage are poor competitors with weeds. Control small weeds by harrowing until 3 to 5 days after mustard germination. Harrowing after emergence is not recommended.

**L2. Stinger\*** (clopyralid) applied POST controls several broadleaf weeds and volunteer crops in canola, rapeseed, and crambe. Stinger\* is most effective when applied to common cocklebur, giant ragweed, volunteer sunflower, wild sunflower, volunteer alfalfa, and volunteer soybean up to the 6-leaf stage, common ragweed up to the 5-leaf stage, and wild buckwheat in the 3- to 5-leaf stage before vining begins. Stinger\* is most effective on Canada thistle in the rosette to pre-bud growth stage but rosette application often gives better control than later application.

\*Or generic equivalent.